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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,213	04/19/2001	Takeshi Yamawaki	35.G2776	6923

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EXAMINER
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GLASS, CHRISTOPHER W

ART UNIT	PAPER NUMBER
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2878

DATE MAILED: 05/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/837,213

Applicant(s)

YAMAWAKI, TAKESHI

Examiner

Christopher W. Glass

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 April 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 April 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All   b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Abstract***

1. The abstract of the disclosure is objected to because its length exceeds 150 words.

Correction is required. See MPEP § 608.01(b).

### ***Drawings***

2. The drawings are objected to because in Figures 8 and 9B, the shape of element 10 (polygon mirror) does not adequately depict the configuration of this component and its function in the optical system. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Objections***

4. Claim 12 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 4. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,161,047 to Tomita et al.

Regarding claim 1: Figures 1A and 1B of Tomita show an optical scanning device comprising a first optical system, including a light source **10**, for directing a light beam emitted from the light source to deflection means **18,19**, and a second optical system for focusing the light beam (via f $\theta$  lens **20**, light shield **22**, and anamorphic lens **24**), reflected and deflected by the deflection means **18,19**, on an effective scanning area of a scanning surface **26**, thereby scanning a plurality of lines on the effective scanning area. The light source **10** remains lit during a period of time between the scanning of each of the plurality of lines on the effective scanning area and a light shield member **22** is positioned between the deflection means **18,19** and the scanning surface **26** to block at least a portion of the light beam emitted during the period of time between the scanning of each of the plurality of lines on the effective scanning area.

Regarding claim 7: Tomita shows in Figures 1A and 1B an optical scanning device comprising a first optical system, including a light source **10**, for directing a light beam emitted from the light source to a deflection surface **19** of deflection means **18** in a beam width wider than the width of the deflection surface **19** in a main scan direction. Also disclosed is a second optical system (comprising f $\theta$  lens **20**, light shield **22**, and anamorphic lens **24**) for focusing the

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light beam reflected and deflected by the deflection means **18,19**, on an effective scanning area of a scanning surface **26**, thereby scanning a plurality of lines on the effective scanning area.

The light source **10** remains lit during a period of time between the scanning of each of the plurality of lines on the effective scanning area and a light shield member **22** is positioned between the deflection means **18,19** and the scanning surface **26** to block at least a portion of the light beam emitted during the period of time between the scanning of each of the plurality of lines on the effective scanning area.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2,8,10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita.

Regarding claims 2 and 8: Although the disclosure of Tomita does not specifically cite an optical scanning device having a scanning efficiency of 70% or higher, or 80% or higher (where “scanning efficiency” is taken to be “the ratio of a theoretical scanning angle range, within which one deflection surface can scan a light beam, to a scanning angle range for scanning an effective scanning area”), it would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the device of Tomita to exhibit such an efficiency (specification, page 3, lines 8-11). This would involve only routine experimentation with the optical system elements such as the light source **10** and deflection means **18,19** (see

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Figures 1A and 1B). It has been held that discovering optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 10: Tomita shows in Figures 1A and 1B an optical scanning device comprising a first optical system, including a light source **10**, for directing a light beam emitted from the light source to a deflection surface **19** of deflection means **18** in a beam width wider than the width of the deflection surface **19** in a main scan direction. Also disclosed is a second optical system (comprising f $\theta$  lens **20**, light shield **22**, and anamorphic lens **24**) for focusing the light beam reflected and deflected by the deflection means **18,19**, on an effective scanning area of a scanning surface **26**, thereby scanning a plurality of lines on the effective scanning area. The light source **10** remains lit during a period of time between the scanning of each of the plurality of lines on the effective scanning area and a light shield member **22** is positioned between the deflection means **18,19** and the scanning surface **26** to block at least a portion of the light beam emitted during the period of time between the scanning of each of the plurality of lines on the effective scanning area.

The deflection means **18** shown by Figure 1A of Tomita shows the border area between adjacent deflection surfaces **19** as being somewhat continuous and not having a significant corner or separate surface between adjacent deflection surfaces, and Figure 2C shows a configuration wherein the polygon deflection means **18A** comprises anti-reflection zones **1B** and reflection zones **1A** "having a predetermined width" (Column 5, line 46). It would have been obvious to one having ordinary skill in the art to configure the deflection means **18,19** of Tomita to include a border area between adjacent deflection surfaces in a main scan direction having a width of 1% or less of the width of each deflection surface. While the corner border areas of

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Figure 1A are not expressly disclosed as exhibiting this ratio, it would have been obvious to construct them to have such a relationship, or to provide, as the border areas, reflection zones **1A** or anti-reflection zones **1B** disposed vertically rather than laterally as shown in Figure 2C, in order for these border areas to have a substantially negligible effect on the scanning performed on the scanning surface **26**. It has been held that discovering an optimum value of a result effective variable (e.g. the width of the border areas) involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 11: Tomita shows in Figures 1A and 1B an optical scanning device comprising a first optical system, including a light source **10**, for directing a light beam emitted from the light source to a deflection surface **19** of deflection means **18** in a beam width wider than the width of the deflection surface **19** in a main scan direction. Also disclosed is a second optical system (comprising f $\theta$  lens **20**, light shield **22**, and anamorphic lens **24**) for focusing the light beam reflected and deflected by the deflection means **18,19**, on an effective scanning area of a scanning surface **26**, thereby scanning a plurality of lines on the effective scanning area. The light source **10** remains lit during a period of time between the scanning of each of the plurality of lines on the effective scanning area and a light shield member **22** is positioned between the deflection means **18,19** and the scanning surface **26** to block at least a portion of the light beam emitted during the period of time between the scanning of each of the plurality of lines on the effective scanning area.

The border area between adjacent deflection surfaces of the deflection means shown by Figure 1A of Tomita is not expressly disclosed as having one deflection surface **19** extending over the other adjacent deflection surface, and the length of the extension in a main scan

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direction is not specifically cited as being 5% or less of the beam width of the light beam reflected and deflected from the deflection surface **19** in the main scanning direction. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to extend the deflection surfaces **19** of Tomita by such a length, or to dispose vertically a reflection zone **1A** (Figure 2C) on the border areas, in order to enhance the deflection capabilities and effective scanning area for the optical scanning system.

9. Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita, in view of U.S. Patent No. 6,288,818 to Yoshimaru. The modified device of Tomita shows in Figure 1A the light beam from the first optical system (comprising light source **10**) incident at a right angle on a deflection surface **19** of the deflection means **18** in a sub scanning cross-sectional plane. While the modified device of Tomita does not expressly disclose the light beam as incident at an oblique angle, it is well known in the art to configure the optical elements to produce a light beam having such an orientation. Yoshimaru shows in Figure 1 an optical scanning device having a light beam from source **12** incident at an oblique angle on a deflection surface of the deflection means **4** in a sub scanning cross-sectional plane. It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the light source **10** of Tomita in this fashion, in relation to the deflection means and surface **18,19**, in order to change aspects of the resulting scanning area formed on scanning surface **26**, as desired.

10. Claims 4-6 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita, in view of U.S. Patent No. 5,750,986 to Genovese.



Regarding claims 4 and 12: Figures 1A and 1B of Tomita show an optical scanning device comprising a first optical system, including a light source **10**, for directing a light beam emitted from the light source to deflection means **18,19**, and a second optical system for focusing the light beam (via fθ lens **20**, light shield **22**, and anamorphic lens **24**), reflected and deflected by the deflection means **18,19**, on an effective scanning area of a scanning surface **26**, thereby scanning a plurality of lines on the effective scanning area. The light source **10** remains lit during a period of time between the scanning of each of the plurality of lines on the effective scanning area and a light shield member **22** is positioned between the deflection means **18,19** and the scanning surface **26** to block at least a portion of the light beam emitted during the period of time between the scanning of each of the plurality of lines on the effective scanning area.

Tomita does not expressly disclose a photoconductive body arranged on the scanning surface **26** of the scanning device, a development means for developing, into a toner image, an electrostatic latent image that has been formed with the light beam scanning the photoconductive body, a transfer means for transferring the developed toner image onto a paper sheet, and a fixing means for fixing the transferred toner image onto the paper sheet. However, it is well known to implement these elements in an image forming apparatus. Figure 1 of Genovese shows an image forming apparatus comprising an optical scanning device **24**, having a photoconductive body **10** arranged on the scanning surface of the optical scanning device **24**, a development means (stations **B** and **C**, see Column 4, lines 20-60) for developing, into a toner image, an electrostatic latent image that has been formed with the light beam (from optical scanning device **24**, see also Figure 2) scanning the photoconductive body **10**, and a transfer means and fixing means (station **D**, see Column 4, line 61- Column 5, lines 1-3 and 41-53) for transferring the developed toner

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image onto a paper sheet **60** and for fixing the transferred toner image onto the paper sheet **60**, respectively. It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the photoconductive body, development means, transfer means, and fixing means of Genovese in the device of Tomita, in order for an image scanned onto the scanning surface **26** (Figure 1A and 1B, Tomita) to be developed and transferred as an image onto a paper sheet.

Regarding claims 5 and 13: Figures 1A and 1B of Tomita show an optical scanning device comprising a first optical system, including a light source **10**, for directing a light beam emitted from the light source to deflection means **18,19**, in a beam width wider than the width of the deflection surface **19** in a main scan direction, and a second optical system for focusing the light beam (via f $\theta$  lens **20**, light shield **22**, and anamorphic lens **24**), reflected and deflected by the deflection means **18,19**, on an effective scanning area of a scanning surface **26**, thereby scanning a plurality of lines on the effective scanning area. The light source **10** remains lit during a period of time between the scanning of each of the plurality of lines on the effective scanning area and a light shield member **22** is positioned between the deflection means **18,19** and the scanning surface to block at least a portion of the light beam emitted during the period of time between the scanning of each of the plurality of lines on the effective scanning area.

Tomita does not specifically cite a printer controller as being employed for converting code data input from an external device into an image signal and feeding the image signal to the optical scanning apparatus. However, it is well known in the art to implement printer control in such a device. Genovese shows in Figure 2 an optical scanning device, comprising a sensor network **106** and data source and laser driver **152**. "The sensor network **106** generates a start-of-

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scan signal **108** and a differential beam intensity signal **110**...Signals from the sensor network **106** and an image data source control laser driver circuit **152**, which provides a timed data stream that represents the desired image in the form of electrical current that excites the laser diodes **150** and **151**" (Column 4, lines 35-43). It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the sensor network **106** and laser driver circuit **152** of Genovese in the device of Tomita, to convert and feed data, such as from a computer, to the optical scanning device, and in order to control and process images to be formed.

Regarding claims 6 and 14: The image forming apparatus of the modified device of Tomita forms images through a Background Area Exposure process (see Column 4, lines 44-60).

### *Conclusion*

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

U.S. Patent No. 4,306,242 to Jeffery shows in Figure 1 an optical scanning device employing a light source **13** and rotating deflection means **37**, having a deflection light shield member **59** positioned between the deflection means and the scanning surface, and controlled by a computer **29** and timing generator **31**. The scanning beam **33** impinges on a scanning surface of a rotating photoconductive drum **45**.

U.S. Patent No. 5,786,594 to Ito et al discloses in Figure 3 an optical scanning device comprising a rotating housing unit **1** for varying the incident angle of a light beam incident upon deflection means **3**.

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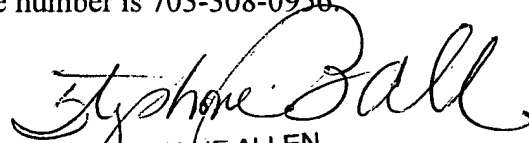
U.S. Patent No. 6,266,174 to Aoki shows in Figures 6 and 8 light shield members **210** and **20-1,20-2**, respectively, disposed before a deflecting member **30** in the scanning system.

U.S. Patent No. 5,774,248 to Komatsu shows in Figure 15 an optical scanning system comprising a light-shielding member **78** provided before the deflecting member **4**, and controlled by a CPU **110** and controller **100**.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher W. Glass whose telephone number is 703-305-1980. The examiner can normally be reached 9:00am-6:00pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached at 703-308-4881. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

  
STEPHONE ALLEN  
PRIMARY EXAMINER

cg  
May 15, 2002